

**REMARKS**

Claims 1-63 are all the claims pending in the application.

Claims 1-30, 32-33, 40-41 and 47-61 are rejected under 35 U.S.C. § 112, second paragraph.

Claims 31-33, 35, 39-41 and 43 have been rejected under 35 U.S.C. § 102(e) as being anticipated by Liao (US 6,185,208).

Claims 1, 16 and 47 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicants' admitted prior art in view of Lakshman ("High-speed policy-based packet forwarding using efficient multi-dimensional range matching", ACM SIGCOMM Computer Communication Review, vol. 28, No. 4, 1998, pp. 203-214).

Claims 2, 7-15, 17, 22-30, 48, 53-61 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicants' admitted prior art in view of Lakshman as applied to claims 1, 16 and 47 and further in view of Spinney (5,414,704).

Claims 3, 18 and 49 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over applicants' admitted prior art in view of Lakshman as applied to claims 1, 16 and 47 and further in view of Chaudri (6,275,861).

Claims 4-5, 19-20 and 50-51 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over applicants' admitted prior art in view of Lakshman as applied to claims 1, 16 and 47 and further in view of Kerr (6,590,894).

Claims 6, 21 and 52 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over applicants' admitted prior art in view of Lakshman as applied to claims 1, 16 and 47 and further in view of Thomas (A User Guide to the Unix System, Rebecca Thomas, et al, 1985).

Claims 7, 22, 53 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicants' admitted prior art in view of Lakshman as applied to claims 2, 17 and 48 and further in view Chaudri (6,275,861).

Claims 8-9, 23-24 and 54-55 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicants' admitted prior art in view of Lakshman and further in view of Spinney, as applied to claims 1, 16 and 47, and further in view of Kerr (6,590,894).

Claims 10, 25 and 56 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicants' admitted prior art in view of Lakshman, and further in view of Spinney, as applied to claims 2, 17 and 48, and further in view of Thomas.

Claims 11, 26 and 57 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicants' admitted prior art in view of Lakshman, and further in view of Spinney, as applied to claims 2, 17 and 48, and further in view of Sternberger (4,788,656).

Claims 36-and 44 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Liao (6,185,208) in view of Applicant's admitted prior art.

Claims 34, 36-38, 42, 44-46 and 62-63 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Liao (6,185,208).

The Applicants traverse the rejections and request reconsideration.

***Interview dated June 1, 2004***

In the above interview, all the pending claims were discussed. The Applicants discussed the grounds for the pending rejections. Specifically, the Applicants argued that the combination of features recited in the pending claims were not suggested by the cited references. The Examiner suggested including specific ranges in the claims and to include the definition of

tuples. The Applicants thank the Examiner for the suggestions and have amended the claims in line with the Examiners suggestions.

***Claim Rejections under 35 U.S.C. § 112***

Claims 1-30, 32-33, 40-41 and 47-61 are rejected under 35 U.S.C. § 112, second paragraph.

The Applicants respectfully amend the base claims to include specific ranges for the values of M and N to overcome the above rejection based on section 112.

***Claim Rejections based primarily on Liao***

Claims 31-33, 35, 39-41 and 43 are rejected under 35 U.S.C. § 102(e) as being anticipated by Liao (U.S. Patent No. 6,185,208).

The Applicants amend the claims to further distinguish the present invention from the cited references. The Aplpicnats respectfully submit that the Examiner is incorrectly interpreting the alleged teachings of Liao as shown in column 8, lines 9-14 and equation 1. Liao uses in this example a single 32-bit IP address and uses as its subfields the 8 bits which comprises the commonly known numbering sequence, or IP address, for example the IP address 204.163.165.111. Each such subfield is by definition 8-bits long and therefore the result of the sequence proposed by Liao will render the 8-bit hash number. Specifically, Liao shows how to take a single IP address and its corresponding port, dividing it into equal portions, for example 8-bits, and performing a XOR operation between the six sub-fields. Examiner contends that the case of N=48, X=40, Y=8 and Z=8 would cover the Liao case.

However, the Examiner fails to explain how one could extend Liao to cover a full range tuple as used in the present invention, rather than a single IP address. It should be noted, for

example, that in an embodiment a tuple contains a source address (32-bits), a destination address (32-bits), a source port (16-bits), a destination port (16 bits), and a protocol indicator (8 bits) for a total of 104 bits. For example, clearly Liao does not show the case of N=104, X=96, Y=8, and Z=20.

Claim 31 is not anticipated by Liao at least for the above reasons.

Claim 39 is a computer program product claim that includes limitations similar to the ones in claim 31. Therefore, the arguments discussed above are analogously valid.

Claims 32-33, 35, 40-41 and 43 are allowable at least based on their dependency on claims 31 and 39.

Claims 36 and 44 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Liao (U.S. Patent No. 6,185,208) in view of applicant's admitted prior art (APA) (Instant application).

Claims 34, 36-38, 42, 44-46 and 62-63 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Liao (U.S. Patent No. 6,185,208).

The above claims are dependant on base claims 31 and 39. Therefore, the arguments discussed above in relation to base claims 31 and 39 are equally valid. Further, the Examiner has not cited additional references to overcome the deficiencies noted in the teachings of Liao.

***Claim rejections primarily based on Lakshman***

Claims 1, 16 and 47 are rejected under 35 U.S.C. § 103(a) as being unpatentable over applicant's admitted prior art (APA) (Instant application) in view of Lakshman ("High-speed policy-based packet forwarding using efficient multi-dimensional range matching", ACM SIGCOMM Computer Communication Review, vol. 28, No. 4, 1998, pp. 203-214).

Notwithstanding the Examiner's assertions to the contrary, Lakshman in fact recognizes the difficulty in having the features related to the hash function of the kind used in the present invention by asserting that "...any hash function that is used must... randomly distribute 100 to 200 bit keys of the header to no more than 20-24 bits of hash index. Since there is no knowledge about the distribution of the header values... the design [of] a good hash function is not trivial" (page 205, column 1, lines 17-22), and further notes that efficient classification algorithms "must be fast enough for use in routers with Gigabit links..." and further notes that "the algorithm must be able to process every packet arriving to the physical interface at wire-speed" (page 205, column 2, section 2.2 #1 and #2). Because of those limitations it is clear that Lakshman does not suggest a data packet classifier that includes a hash generator capable of handling the reduction of over 84 bits, typical of a network tuple, to a range of below 32 bits.

In contrast, the present invention includes a hash generator that could, for example, reduces a 104 bit tuple that is typical in a network to a 20 bit hash address, thus overcoming the significant limitation noted by Lakshman.

Further, the claims have been amended to clarify the precise definition of tuple and further specify the tuple to be an IP network tuple.

Claims 16 and 47 include limitations analogous to the ones discussed above in relation to claim 1. Therefore, the arguments discussed above in relation to claim 1 are analogously valid.

Claims 2-14, 17-30 and 48-61 are dependant on claims 1, 16 and 47. Therefore, they should be patentable at least by virtue of their dependency.

The Applicants incorporate by reference the arguments made against the rejection of the above dependant claims in the response filed December 10, 2003. Further, the Applicants

respectfully submit that the secondary references cited by the Examiner, namely, Spinney, Chaudri, Kerr, Thomas and Sternberger do not overcome the deficiency noted above in the teachings of Lakshman.

Further, it is further noteworthy that Examiner stresses that “APA further teaches that according to theory the best way... is to use a full 104-bit tuple....” However, the Examiner ignores the fact that Lakshman claims that using the full range is at least not trivial and teaches away from the present invention by suggesting a different solution. Clearly the present invention represents a solution that was not envisioned by Lakshman as discussed above. The Applicants respectfully reiterate that Spinney is not believed to be a relevant prior art. The Examiner has failed to show a motivation for a person skilled in the art to combine the teachings of Lakshman and Spinney.

Lakshman, admittedly does not show a capability of handling a large tuple. The APA states that it would be advantageous to do so, and provides a solution for a 48 bit case, similar to the handling of Liao discussed previously. It is noteworthy that in column 3 lines 3-10 of Spinney it is noted that that “the vast majority of lookups are obtained by hashing the address, using a programmable 48-bit to 48-bit linear hash function”. Spinney suggests a more elaborate scheme. However, Spinney’s solution is still restricted to a 48-bit solution, well within the limitation known by Lakshman.

#### Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the

**Amendment under 37 C.F.R. § 1.114(c)**  
**U.S. Application No.: 09/547,034**

**Attorney Docket No.: Q58178**

Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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Date: July 7, 2004